

22. (Four Times Amended) Apparatus for switching a current source out from a load, comprising:

means for opening a transistor switch connecting said current source to said load; and

means for closing a switch to a pull-down mirror path in parallel with said transistor switch at substantially simultaneously a same time as said means for opening opens said transistor switch so that current from said current source flows through said pull-down mirror path, said pull-down mirror path and said transistor switch operating complementary to one another to ensure a constant current path from said current source and to equalize a current level produced by said current source;

wherein said load [substantially continuously] receives said current flowing from said current source when current is switched from said pull-down mirror path to said load [and] thereby reducing charge injection [is reduced] from said current source to said load during switching of [said] current [source while said current source remains powered when said transistor switch is opened].

REMARKS

Claim 10 is canceled herein. Claims 1, 11, 18, 21 and 22 are amended herein. Claims 1-9, 11-14 and 18, 19, 21 and 22 remain pending in the application.

Interview

The Applicant thanks the Examiner for the interview on March 12, 2003. The Applicant and the Examiner came to a consensus as to amendments made herein to overcome the objections and rejections.

Objection to the Disclosure

The disclosure was objected to as allegedly containing informalities. In particular, the Office Action objected to the disclosure as allegedly needing clarification and containing inconsistencies in labeling.

Clarification was made concerning the disclosure during the interview, with the Examiner acknowledging the disclosure is clear as written.

The disclosure is amended herein to overcome the objection to labeling within the disclosure.

All objections have been addressed by the Applicant. The Applicant respectfully requests the objections be withdrawn.

Section 112 rejection of Claims 1-14, 18, 19, 21 and 22

Claim 10 is canceled herein, making the rejection of claim 10 now moot.

The claims have been reviewed and are amended where appropriate according to agreements reached during the interview. It is respectfully submitted that the claims are now in full conformance with 35 USC 112. It is respectfully requested that the rejection be withdrawn.

Claims 1-5, 8-10, 12-19, 21 and 22 over Ravon

In the Office Action, claims 1-5, 8-10, 12, 18, 19, 21 and 22 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by US Patent

No. 6,137,275 to Ravon ("Ravon"), and claims 13 and 14 are rejected as obvious over Ravon. The Applicant respectfully traverses the rejection as follows.

Claim 10 is canceled herein, making the rejection of claim 10 now moot.

Amendments are made herein to independent claims 1, 18, 21 and 22 according to changes discussed during the interview. The changes made herein were agreed to by the Examiner to overcome the cited prior art.

Accordingly, for at least all the above reasons, claims 1-5, 8, 9, 12-14, 18, 19, 21 and 22 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 6, 7 and 11 over Ravon in view of AAPA

In the Office Action, claims 6, 7 and 11 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Ravon in view of Applicant's Admitted Prior Art Fig. 3 (AAPA). The Applicant respectfully traverses the rejection as follows.

Claims 6, 7 and 11 are dependent on claim 1, and are allowable for at least the same reasons as claim 1 is allowable.

Amendments are made herein to independent claim 1 according to changes discussed during the interview. The changes made herein were agreed to by the Examiner to overcome the cited prior art.

Accordingly, for at least all the above reasons, claims 6, 7 and 11 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 1-5, 8-10, 12-14, 18 and 19 over Harston

In the Office Action, claims 1-5, 8-10, 12-14, 18 and 19 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over US Patent No. 5,343,196 to Harston ("Harston"). The Applicant respectfully traverses the rejection as follows.

Claim 10 is canceled herein, making the rejection of claim 10 now moot.

Amendments are made herein to independent claims 1, 18, 21 and 22 according to changes discussed during the interview. The changes made herein were agreed to by the Examiner to overcome the cited prior art.

Accordingly, for at least all the above reasons, claims 1-5, 8, 9, 12-14, 18 and 19 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 6, 7 and 11 over Harston in view of AAPA

In the Office Action, claims 6, 7 and 11 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Harston in view of AAPA. The Applicant respectfully traverses the rejection as follows.

Claims 6, 7 and 11 are dependent on claim 1, and are allowable for at least the same reasons as claim 1 is allowable.

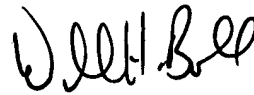
Amendments are made herein to independent claim 1 according to changes discussed during the interview. The changes made herein were agreed to by the Examiner to overcome the cited prior art.

Accordingly, for at least all the above reasons, claims 6, 7 and 11 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Conclusion

All rejections having been addressed, it is respectfully submitted that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,



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Version with Markings to Show Changes Made

1. (Five Times Amended) A current source switching circuit with reduced charge injection, comprising:

a current source;

a transistor switch path;

a pull-down mirror path, comprising an amplifier and a switch controlling current flow to said amplifier, in parallel with said transistor switch path operating to ensure a constant current path from [equalize a current level produced by] said current source; and

a first load;

wherein said transistor switch path and said pull-down mirror path operate complementary to one another to [substantially continuously] reduce said charge injection flowing to said first load during switching of current [said current source while said current source remains powered].

11. (Amended) The current source switching circuit according to claim 1[0], wherein said [complementary] pull-down mirror path [transistor] switch comprises:

a series combination of a functional transistor with a respective compensating transistor connected to either side of said functional transistor.

18. (Five Times Amended) A method of reducing charge injection from a current source through a current switch into a load, said method comprising:

providing a pull-down mirror path in parallel with said current switch, said pull-down mirror path and said current switch operating to ensure a constant current path from [equalize a current level produced by] said current source;

turning a switch in said pull-down mirror path on when said current switch is turned off; [and]

amplifying current directed to said pull-down mirror path; and

turning said switch in said pull-down mirror path off when said current switch is turned on;

wherein said current switch and said pull-down mirror path operate complementary to one another [substantially continuously] to reduce said charge injection flowing to said load during switching of current flow [said current switch while said current source remains powered].

21. (Four Times Amended) A method of switching a current source out from a load, said method comprising:

opening a transistor switch connecting said current source to said load; and

substantially simultaneously with said step of opening, closing a switch to a pull-down mirror path, comprising an amplifier, in parallel with said transistor switch so that current from said current source flows through said pull-down mirror path, said pull-down mirror path and said transistor switch operating complementary to one another to ensure a constant current path from said current source and to equalize a current level produced by said current source;

wherein said load [substantially continuously] receives said current flowing from said current source when current is switched from said pull-down mirror path to said load [to] thereby reducing[e] charge injection from said current source to said load during switching of [said] current [source while said current source remains powered when said transistor switch is opened].